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AUTHOR Stowe, Richard A.
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ABSTRACT

This paper describes two modes of educational decision-making: Mode I, in which the instructor makes such decisions as what to teach, to whom, wher, in what order, at what pace, and at what complexity level; and Mode II, in which the learner makes the decisions. While Mode I comprises most of what is regarded as formal education, the learner in Mode II selects what he wishes to study, when, and in what order. He decides upon his own instructional strategies, sets his own pace, remediates himself through difficulties, selects his own "optimum" road to mastery, and sets his own criteria. This process enables him to acquire learning appropriate to his needs and purposes; structured and presented in a manner suited precisely to his own previous learning, cognitive style, and other aptitudes; and sufficient to achieve his particular objectives; all without delay and at modest cost. Although Mode II is not readily attainable, its elements are within reach, and it is expected that the future of both educational technology and higher education will rest increasingly with Mode II learning.
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A la MODE II

by

Richard A. Stowe

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A la Mode II

Perplexing times, these, in which to try to make sense of the field of educational technology and the process of higher education. Both are awash in change and tumult. Flux is so much a part of both that the principal journal directed at technology in higher education is called Change.

If one can read the trend of change aright, then one can cope with change, anticipate it, predict its next turn, arrive there just before it and thrive on it. This was Toffler's hope in offering us Future Shock a few years back; the accelerating rate of change he predicted has in no way slackened, and many of our colleagues have already felt the disabling consequences of unpreparedness for change. In this paper, I propose to draw a fundamental distinction between two types, or modes, of education, and to suggest that we are well on our way toward moving from one mode to the other, and to assert further that we in educational technology in higher education will spend much of the remainder of our careers in the second of these modalities. Moreover, by defining the second mode in rather pure terms, we should be able to determine with some precision how far our field will go toward actualizing it, at what rate, and with what consequences for our professional lives and our institutions.

First, the distinction. In Mode I, decisions as to what to teach, to whom, when, in what order, and what pace and level of complexity, and to what degree of mastery are all made by the instructor operating ostensibly in the "best interests" of the learner.

By contrast, in pure Mode II the decisions are the learner's. He (by which I shall mean he or she) selects what he wishes to study, when, and in what order. He decides upon his own instructional

strategies, sets his own pace, remediates himself through difficulties, selects his own "optimum" road to mastery, and sets and--given a degree of success--meets his own criteria. At length, he even determines when he is "through."

Mode I, then, comprises most of what we regard as formal education--teacher-oriented and somewhat authoritarian. At its worst (perhaps typified by Mr. Gradgrind's school in Dicken's Hard Times, it stifled the human spirit. But at its best, and it can be very good, Mode I is both effective and efficient, meaning that it can produce considerable learning for a relatively modest investment of human and fiscal resources. Also, it creates social learning situations which most of us--products as we are of Mode I schooling--remember somewhat imperfectly with great fondness.

Mode II, by contrast, has been out of favor for centuries. It has been slow, cumbersome, enormously inefficient, and wanton of the most precious resource, the learner's time and energy. We have professed some admiration for the self-taught--the Eric Hoffer's--but have largely regarded their accomplishments as an aberration, a good fortune which few in our society have achieved by dint of their own labors. We even wonder how much more learned these obvious geniuses would have become had they had the advantages of formal schooling.

Do not misunderstand--this is no polemic against Mode I learning. Indeed, Mode I has been enormously successful and will no doubt continue to be the preferred modality for instructing the young, for disseminating uniform knowledge to homogenious audiences, and for learning outcomes involving social ends and human relations. Many of the advances made in educational technology over the past three or four decades will continue to find their most productive application in Mode I learning, and as professionals we cannot entertain

the notion of abandoning it.

But signs of Mode II have begun to appear with increasing frequency. Its latest incarnation seems to date from about the time of publication of Fred Keller's classic paper with the unfortunate title "Goodbye, Teacher." Educators began experimenting with individual pacing, programmed instruction, IPI, discovery learning, B. Frank Brown's "quest phase," computer-assisted instruction, and, more recently, long distance learning and open learning. All encompass some elements of Mode II in that they restore some of the instructional options to the learner. Still more recent user-oriented technologies, such as those embodied in the OCLC network, the latest Edunet (The National Computer Network in Higher Education) link-ups, the satellite delivery system of PBS, the various medical and legal information retrieval systems (such as Medlars), ERIC and its counterparts, promise to liberate many learners from arbitrary controls and grant them the initiative for pursuit of their own learning. The AMA has tested a Thompson-CSF optical video disc player with two one-hour courses offered for CEU's. The ABA's consortium for Professional Education now distributes fourteen video programs in circulation to its membership.

Another illustration of "early Mode II" is the Information via Television Project conducted by the University of Cincinnati Medical Center. There a physician at any one of a number of receiving sites of the Biomedical Communications network can query the Health Sciences Library for data on specific drug treatment. Note the dispersed locations of the "learners" (the physicians), the highly specific need which each one has at a given moment, and the often extreme need for speedy retrieval of the information. The final consideration--cost--appears to be operating within reasonable bounds.

An intriguing demonstration of teleconferencing by satellite

was conducted in 1977-78 by Satellite Business Systems. Known as Project Prelude, the four-month experiment made on-site terminal equipment available in the management suites of four large national corporations. The study highlighted some prospect for person-to-person long-distance communications, but also made many of the tough logistical problems visible.

Of considerable interest are the research studies of Penland, Tough, and others who are unearthing a trend toward "self-planned" or "self-directed" learning among adults. Allen Tough has discovered that the average adult spends about two hours a day in learning projects, seventy per cent of which is self-planned. Patrick Penland's survey revealed that four out of five adult Americans are engaged in self-planned instruction, but fewer than one-fourth of them use the customary devices of formal education such as teachers and classes for their study, and only fourteen per cent make regular use of libraries. Most such learners seem to avoid the usual formal channels except in extreme cases. Rather, Penland found them developing their own learning patterns with some reliance on human "learning consultants" or group planners. They also drew upon television courses, programmed instruction and workbooks.

Could it be that the majority of adult learners are opting for Mode II instruction right under the noses of institutions of higher education? Obviously. And why? Penland reports a preference for "those planning modes which include the self as planner ('teacher') . . .." The reasons for undertaking learning projects listed by Penland reflect clearly the range of instructional decision-making which adults prefer to reserve to themselves:

"I like my own way of learning and speed of going about doing it." (decisions regarding learning strategy and pacing)

> "I wanted to keep the learning (strategy) flexible and easy to change."
>
> "I want to put my own structure on the learning (project) rather than wait for a course." (decisions regarding the nature of the learning task)

Penland concludes perceptively that "communicators and educators may increasingly want to take into account this growing need of many people for more control over the learning enterprise." (italics added)

It is worthwhile to note here the various dimensions of Mode II. A common misconception is that self-directed learners prefer to pursue their study in a bumbling, inefficient fashion, laboriously searching out faint leads in the dim recesses of some archive. Some may--the devoted geneologist who experiences gratification upon turning up a buried detail about a distant ancestor after agonizing over old records.

Rather, those learners who value the knowledge to be gained, as distinguished from the process of acquiring it, will regard Mode II learning favorably if it can deliver knowledge with a high efficiency. This entails the dimension of rapidity--the timely retrieval of the desired information. It further involves accessibility, which suggests economy of energy on the learner's part (although the road to learning may not be easy, too often educators have made it unduly difficult; this is no longer tolerable) as well as timeliness. Another dimension, closely linked to the matter of accessibility, is the spatial one: can the learner be served without having to be transported? The answer should be yes, as infor-

mation is the cheapest and most readily transported commodity in our culture at present, maintaining a highly advantageous ratio in respect to transporting, housing, feeding, and maintaining learners. This advantage will doubtless increase in the next decade or two.

Yet another dimension is suitability--does the information have good "fit" to the learner's needs? Keeping in mind that the universe of knowledge is enormous, dynamic, and expanding, and that the learner's needs are in a state of flux, this requirement is difficult to meet with Mode II (given present technology), but even more poorly managed using Mode I. For this, we need a technology of multiplexing signals and, more critical, a technology for learner and task analysis of a high order.

Finally, there is the question of costs, both direct and indirect, to the learner and to the system. Granted, many of their costs are incurred in the time spent by learner or by system personnel, but there are also equipment costs, line costs, storage costs, and the like. These should be minimized, at least in relation to the costs of alternative modalities, if Mode II is to prove valuable--or viable.

It seems reasonable, then, that a learner who is offered a system which gives him almost instant access to that precise knowledge which he needs with a minimum of procedural effort on his part, at modest cost, and almost totally under his control, would react favorably. Societal advantages would also be significant: less wasted motion by learners in the aggragate (whose time is a societal resource of consequence), a net increase in the available usable knowledge base at the disposal of societal members (and thus a generally better informed citizenry), and a heightened disposition on the part of societal members to actually seek and obtain greater amounts of current and useful information.

From these features it is possible to extract the quintessence of Mode II learning. In pure Mode II, all instructional decisions would reside with the learner. The learners would have the advantage of the most direct contact with the learning. Barriers would be removed; intermediaries would be eliminated. The artificialities (and there are many) of our formal systems of learning would cease to exist. So to our definition:

> In pure Mode II learning, the learner--wherever he happened to be--would be able to acquire a segment of learning appropriate to his needs and purposes, structured and presented in a manner suited precisely to his previous learning, his cognitive style, and other aptitudes, and sufficient to achieve his particular objectives, all without delay and at modest cost.

Needless to say, pure Mode II does not exist and may not be achievable with any future technology, however advanced. But each of its dimensions is already partly attainable. Witness the fascinating study conducted by Robert Mager a number of years ago. He connected two small rooms with a two-way intercom system. In one room, he placed his subjects one at a time, with instructions to engage in study. When help was needed, the subject was to call Mager on the intercom. Thus several conditions were present for Mode II learning: although the student had no control of <u>what</u> was studied, he did control the sequence, the pace and timing, and to a large extent, the specific details of the subject matter. No longer was an authority figure present during the learning; hence learning could proceed by the student's rules, not the teacher's. That the learners warmed to this novel learning environment was clearly evident in the fact that most learners, having called Mager for help, summarily turned off the intercom in mid-explanation and matter-of-factly went back

to their studies! It seems that one of the appeals of Mode II learning is the right to cease to be instructed.

A fascinating glimpse into plausible theoretical underpinnings for Mode II comes from the work of Smith and Smith and their colleagues in the field of cybernetics. Departing from the accustomed behavioral viewpoint in which organisms merely respond to external stimuli, these researchers have postulated that the organism takes an initiative toward the environment, and then learns as a consequence of the environment's response. By successive approximations, the organism can then learn to exercise a measure of control over various parts of the environmental subsystem, avoiding or reducing negative events and increasing the probability of positive events. If such cybernetic manipulation of environmental elements, and subsequent learning, characterizes much human activity, this view is directly supportive of the Mode II condition. If, as some have suggested, cybernetic learning activity is highly motivating in that it leads to fulfillment of the organism's primary need to be in control of events, then Mode II can be expected to exert a tremendous motivating force upon learners who engage in it. This speculation may go far to explain why Tough's and Penland's subjects are quick to reject formal, more authoritarian learning modalities in favor of self-directed learning in which they essentially control the learning environment!

The future of both educational technology and higher education can be expected to rest increasingly with Mode II learning. This is what, in part, educators may imply when speaking of "teaching learners how to learn" and "preparing learners for life-long learning," although the full implications of these statements may not yet be apparent to everyone. It seems probable that the 1980's will permit advancement along several of the various dimensions of "pure" Mode II as sketched above--the indifference to the learner's locations,

the specificity with which the learning is structured and presented in accord with the learner's needs, the element of immediacy, and a more competitive cost picture. Certain technologies are already emerging which can be expected to advance the practicality and power of Mode II.

The tendency to decentralize the learning site (and thus to move the instruction closer to the learner's locale) is already apparent with the advent of mobile learning vans, remote computer terminals, and multi-channel cable systems. Satellites and fiber optics may well make extremely complex information-flow networks feasible and--insofar as delivery costs go--inexpensive for most citizens of developed countries by the end of the decade. A critical requirement of Mode II, a feedback line or closed loop by which the learner can communicate with the system, will soon be met in many communities by the introduction of bi-directional cable. (Mode I still holds sway our vocabularies: we talk about "feedback," but by cybernetic reckoning, the back feed is really the front feed, or the learner's initiative.) Computers are known for their responsiveness in nanoseconds, and for their ability to treat any user as though he were the only user in dialogue with the machine at any given time.

Costs may well drop significantly as these technologies become commonplace. The 1980's are likely to see the introduction--at last--of the video disc priced at competitive levels. Continued research and development in the high density storage of information should effect a lowered cost and heightened capability in the storage and retrieval of information. By the end of the decade, as the emerging science of infometrics will attest, information will be the least expensive commodity to process and transport.

The principal barriers to implementing Mode II learning on a

broad scale are the following:

- The sheer bulk of detail exceeds present technology. There is no system now capable of assembling, verifying, cross listing, updating, and storing the requisite volume of data.

- The problem of multiplexing the inquiries and the system responses becomes staggering when the number of users and the potential content fields become numerous.

- The perplexing problems of the "human-machine interface" (the difficulties of getting the person "into the system" and the similar difficulties of getting the needed information out within acceptable lengths of time) remain largely unsolved. Related to these problems are those of the structure of the information within the system which will facilitate retrieval; here our technology is almost certainly at its most primitive.

None of this argument is of course meant to say that we must have a system capable of producing pure Mode II learning before we can realize a great many of the potential benefits. In fact, the four out of five adults who now engage in self-directed studies with extremely low levels of technological support evidence the practicality of such pursuits and argue eloquently that this type of learning is intensely rewarding! It is not assuming too much to suppose that if practitioners in the fields of higher education and educational technology exhibited a bit more sensitivity toward Mode II conditions and sought to free adult learners from many of the frustrating and unwonted trappings of Mode I, the gains would be instantaneous and remarkable. There is little to prevent us,

during the course of the 1980's, from designing more humane and winsome learning systems for the majority of our largest under-served clientele--the mature learners of this country.

Richard A. Stowe, Ed.D.
Director of Instructional Resources
State University of New York
Plattsburgh, NY 12901